J. Helminthol. Soc. Wash.
64(2), 1997 pp. 234–239

Spauligodon petersi sp. n. and *Spauligodon smithi* sp. n. from Lizards of Cape Province, South Africa

CHARLES R. BURSEY,[1,4] CHRIS T. MCALLISTER,[2] AND PAUL S. FREED[3]

[1] Pennsylvania State University, Shenango Campus, 147 Shenango Avenue, Sharon, Pennsylvania 16146 (e-mail: cxb13@psu.edu),

[2] Department of Natural and Applied Sciences, Cedar Valley College, Lancaster, Texas 75134, and

[3] Section of Herpetology, Houston Zoological Gardens, 1513 North MacGregor, Houston, Texas 77030

ABSTRACT: *Spauligodon petersi* sp. n. and *Spauligodon smithi* sp. n. (Nematoda: Pharyngodonidae) discovered in the large intestines of *Mabuya sulcata* and *Pachydactylus bibronii*, respectively, are described and illustrated. *Mabuya sulcata* harbored 45 nematodes, *P. bibronii* 34. *Spauligodon petersi* and *S. smithi* are easily separated from the 2 previously described Ethiopian species. Males and females of *S. petersi* have smooth, filiform tails; eggs have truncated ends. Females of *S. smithi* have spines on a flexible, filiform tails; males have smooth tails; eggs have pointed ends.

KEY WORDS: *Spauligodon petersi* sp. n., *S. smithi* sp. n., nematode, lizard, South Africa.

In a recent helminthological survey of lizards collected in Cape Province, South Africa, 2 western rock skinks, *Mabuya sulcata sulcata* (Peters, 1867), were found to harbor 10 male and 45 female nematodes of an undescribed species of *Spauligodon*, and 1 Bibron's gecko, *Pachydactylus bibronii* (A. Smith, 1845), was found to harbor 10 males and 24 female nematodes of a second undescribed species of *Spauligodon*. *Mabuya s. sulcata* occurs throughout most of western Cape Province, central and western Namibia, and southern Angola. *Pachydactylus bibronii* occurs throughout Cape Province. In South Africa, it is sympatric with about 57 other lizard species.

The genus *Spauligodon* was established when Skrjabin et al. (1960) divided *Pharyngodon* (Diesing, 1861) into 3 genera (*Pharyngodon*, *Parathelandros* [Baylis, 1930], and *Spauligodon* [Skrjabin, Schikhobalova, and Lagodovskaja, 1960]). There are currently 32 recognized species and, with the exception of *Spauligodon goldbergi*, a parasite of the colubrid snake *Sonora semiannulata* from Texas (Bursey and McAllister, 1996), all are from lizards. Of these, 19 species are found in the Palearctic Realm, 6 in the Neotropical, 4 in the Nearctic, 2 in the Ethiopian, and 1 from Oceania. This paper describes the third and fourth species of *Spauligodon* from the Ethiopian Realm.

Materials and Methods

Lizards were collected in Cape Province, South Africa: 1 juvenile *M. sulcata* from Garies, 23 March 1990; 1 adult *M. sulcata* from Springbok, 25 March 1992; 1 adult *Pachydactylus bibronii* from Springbok, 24 March 1990. The lizards were fixed in 10% formalin and preserved in 70% ethanol. In July 1995, the body cavity was opened by a longitudinal incision from vent to throat, and the gastrointestinal tract was removed by cutting across the esophagus and rectum. The esophagus, stomach, small intestine, and large intestine of each lizard were examined separately for helminths. Nematodes were placed in undiluted glycerol, allowed to clear, and examined under a light microscope. Lizards were deposited in the herpetological collection of the Carnegie Museum of Natural History, Pittsburgh, Pennsylvania (*Mabuya sulcata*, CM 130303; *Pachydactylus bibronii*, CM 119285). Measurements (mean and range) are given in millimeters unless otherwise stated.

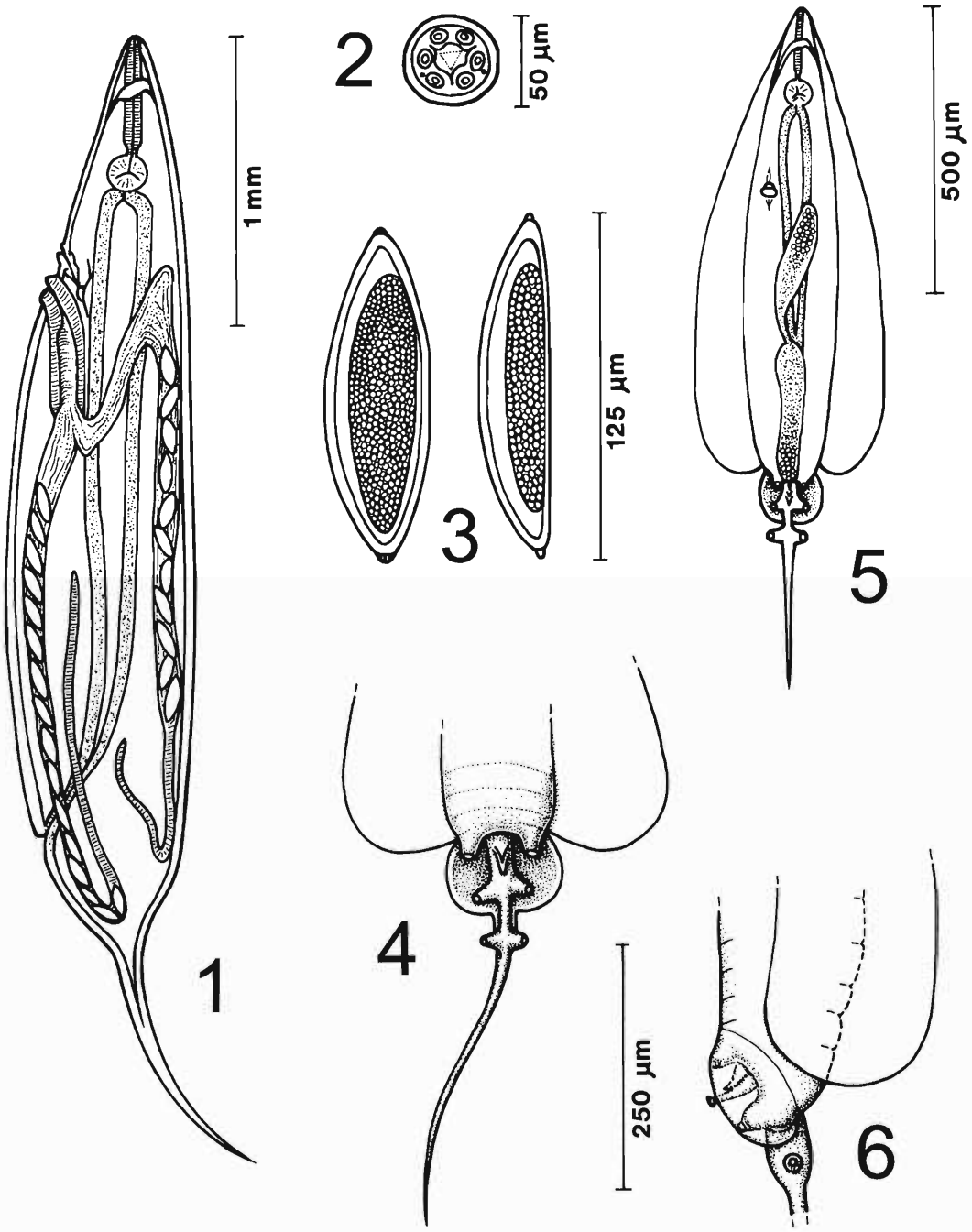
Taxonomic Account

Family Pharyngodonidae Travassos, 1919
Genus *Spauligodon* Skrjabin, Schikhobalova, and Lagodovskaja, 1960
Spauligodon petersi sp. n.
Figs. 1–6

DESCRIPTION: With characters of the genus: specifically; males having caudal alae that do not envelop posterior postcloacal pair of pedunculate papillae; females having vulva in anterior half of body. Nematodes of small size with cylindrical body tapering anteriorly and posteriorly. Lateral alae present in males. Mouth opening triangular, bounded by 3 lips, each with a shallow midline indentation. Esophageal bulb separated from esophageal corpus by small constriction. Excretory pore behind esophageal bulb in both males and females.

MALE (based on 10 specimens): Small,

[4] Corresponding author.



Figures 1–6. ***Spauligodon petersi*** **sp. n. 1. Female, entire, lateral view. 2. Female, en face view. 3. Eggs. 4. Male, posterior end, ventral view. 5. Male, entire, ventral view. 6. Male, posterior end, lateral view.**

white, fusiform nematodes; distinctly truncated posterior end; length 1.23 (0.97–1.50); width at level excretory pore 0.14 (0.09–0.17). Lateral alae 70 μm (65–75) wide at posterior end, narrowing consistently to end at the level of nerve ring. Cuticle smooth but with annulae at 5–8 μm intervals. Mouth opening bounded by 3 bilobed lips. Buccal cavity 10 μm (6–14). Esophagus (including bulb) 0.21 (0.17–0.23); bulb length 0.06 (0.05–0.07); bulb width 0.06 (0.04–0.07). Nerve ring 0.09 (0.07–0.11); excretory pore 0.32 (0.22–0.40), from anterior end. Posterior end truncated, terminating dorsally in elongated filiform tail and laterally in narrow caudal alae. Three pairs of caudal papillae present; precloacal pair sessile and situated at anterior ventral inlet of caudal bursa; adcloacal pair directed posteriolaterally; postcloacal pair not enclosed by caudal alae. Smooth filiform tail 0.24 (0.20–0.26) extends beyond postcloacal papillae. Spicule absent; prominent genital cone in midventral line consisting of small, sharply pointed anterior lip and larger blunt posterior lip.

FEMALE (based on 10 gravid specimens): Small, white, cylindrical nematodes; tapering anteriorly to a blunt point, posterior ending in a long, flexible filiform tail; length 3.08 (2.28–3.77); width at level of vulva 0.30 (0.23–0.36). Cuticle smooth but with annulae at 6–11 μm intervals. Esophagus (including bulb) 0.34 (0.31–0.37); bulb length 0.09 (0.08–0.10); bulb width 0.10 (0.09–0.10). Nerve ring 0.11 (0.09–0.11); excretory pore 0.48 (0.36–0.59); vulva 0.53 (0.38–0.64) from anterior end. Thick-walled ovijector extends posteriorly 0.60 mm, continuing as thinner-walled vagina, 0.12, before joining 2 uteri, 1 directed anteriorly and the other posteriorly. The anteriorly directed uterus reaches the level of the vulva then bends posteriorly. Anterior quarter of gravid female usually free of eggs. Flexible, filiform tail 0.46 (0.36–0.56), without cuticular spines. Eggs fusiform, 130 μm (125–137) × 40 μm (34–43), small knob at each end, flattened on 1 side, with some development at deposition.

Taxonomic summary

TYPE HOST: *Mabuya sulcata sulcata* (Peters, 1867), western rock skink (Sauria: Scincidae).

TYPE LOCALITY: Springbok, Cape Province, South Africa.

SITE OF INFECTION: Large intestine.

TYPE SPECIMENS: Holotype: male, U.S. National Parasite Collection, No. 86749; allotype, 86750; paratypes (9 males, 9 females), 86751.

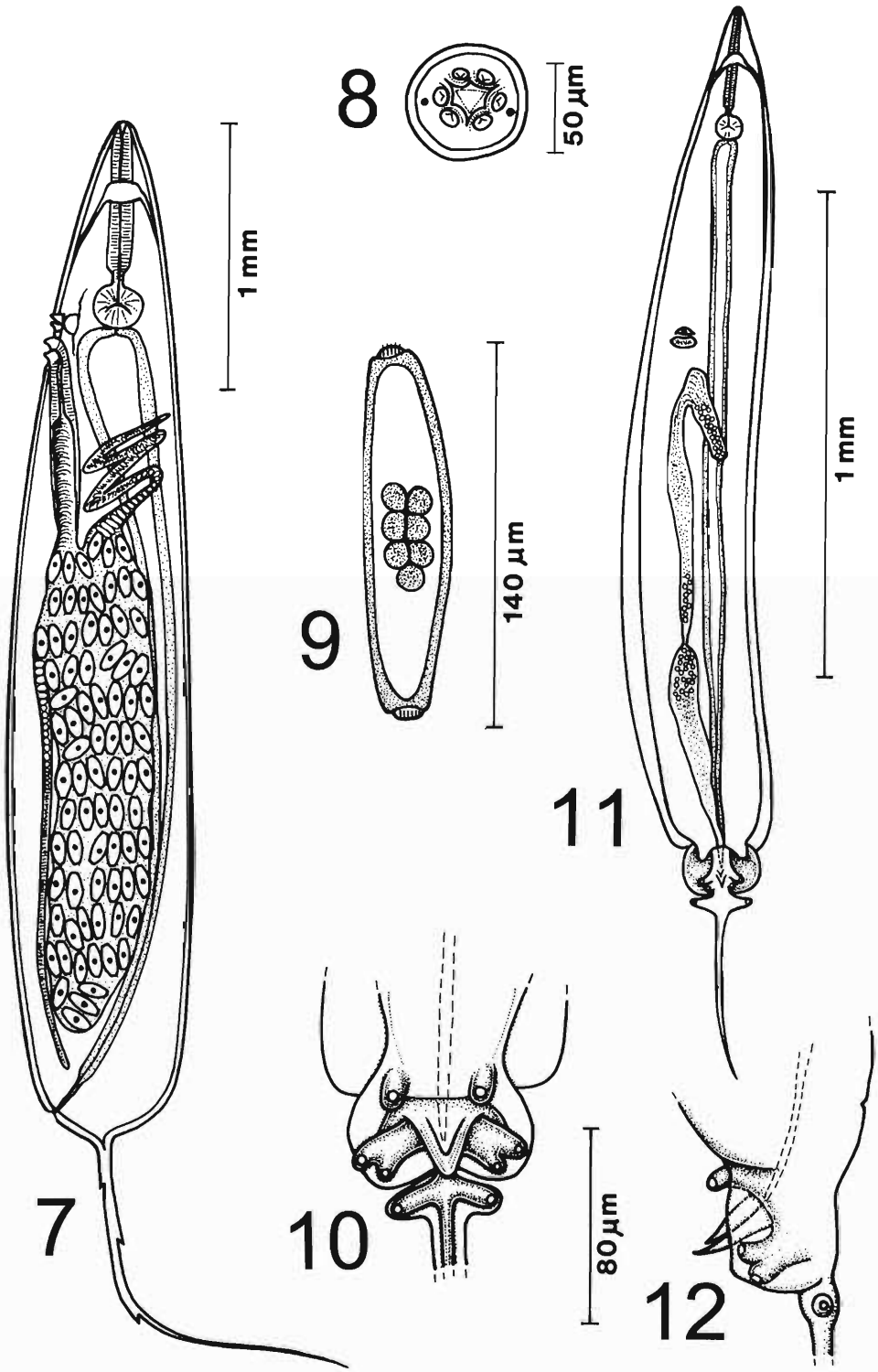
ETYMOLOGY: The specific epithet is given in honor of Wilhelm Peters (1815–1883), German Zoologist, who named *M. sulcata* in 1867.

Family Pharyngodonidae Travassos, 1919
Genus *Spauligodon* Skrjabin, Schikhobalova, and Lagodovskaja, 1960
Spauligodon smithi sp. n.
Figs. 7–12

DESCRIPTION: With characters of the genus, as stated above.

MALE (based on 8 specimens): Small, white, fusiform nematodes; distinctly truncated posterior end; length 1.71 (1.40–2.04); width 0.13 (0.10–0.16) at level excretory pore. Lateral alae 12 μm (9–15) wide, maintaining width from posterior end to level of esophageal bulb, then tapering to end at level of nerve ring. Cuticle smooth with annulations at 12-μm intervals. Mouth opening bounded by 3 bilobed lips; buccal cavity 11 μm (9–14). Esophagus (including bulb) 0.29 (0.27–0.30); bulb length 0.06 (0.05–0.07); bulb width 0.06 (0.05–0.06). Nerve ring 0.11 (0.07–0.14); excretory pore 0.55 (0.46–0.71), from anterior end. Posterior end truncated, terminating dorsally in elongated filiform tail and laterally in narrow caudal alae. Three pairs of caudal papillae present; precloacal pair sessile and situated at anterior ventral inlet of caudal bursa; adcloacal bifurcated laterally and directed posteriorly; postcloacal pair not enclosed by caudal alae. Postcloacal papillae separated from caudal alae by narrow cleft. Smooth filiform tail 0.20 (0.18–0.21), extends beyond postcloacal papillae. Spicule 90 μm (80–97); ventrally directed genital cone in midventral line consisting of small, sharply pointed anterior lip and larger pointed posterior cloacal lip.

FEMALE (based on 6 specimens): Small, white, cylindrical nematodes; tapering anteriorly to a blunt point, posterior ending in a long filiform tail; length 3.05 (2.60–3.77); maximum width 0.38 (0.33–0.41). Cuticle with striations at 1 μm intervals and annulae at 10–15 μm intervals. Esophagus including bulb 0.32 (0.25–0.40); bulb length 0.10 (0.08–0.12); bulb width 0.10 (0.08–0.12). Nerve ring 0.11 (0.10–0.13); excretory pore 0.29 (0.28–0.31); vulva 0.33 (0.31–0.34), from anterior end. Thick-walled ovijector 0.11, leading to thin-walled vagina 0.24, joining 2 uteri, 1 directed anteriorly and the oth-



Figures 7–12. ***Spauligodon smithi*** **sp. n. 7. Female, entire, lateral view. 8. Female, en face view. 9. Egg. 10. Male, posterior end, ventral view. 11. Male, entire, ventral view. 12. Male, posterior end, lateral view.**

Table 1. Mean comparative measurements of various structures in *Spauligodon* spp. from Africa.*

Structure	*S. dimorpha*	*S. morgani*	*S. petersi* sp. n.	*S. smithi* sp. n.
Males				
Length	1.15	1.69	1.23	1.71
Width	0.19	0.14	0.14	0.13
Esophagus	0.35	0.27	0.21	0.29
Bulb (μm)	70 × 75	65 × 65	60 × 60	60 × 60
Nerve ring	0.13	0.08	0.09	0.11
Excretory pore	0.62	0.50	0.32	0.55
Tail length	0.18	0.29	0.24	0.20
Spicule (μm)	Absent	Absent	Absent	90
Females				
Length	4.3	4.4	3.1	3.1
Width	0.35	0.46	0.30	0.38
Esophagus	0.59	0.48	0.34	0.32
Bulb (μm)	130 × 130	110 × 110	90 × 100	100 × 100
Nerve ring	0.14	0.12	0.11	0.11
Excretory pore	0.58	0.69	0.48	0.29
Vulva	0.65	0.76	0.53	0.33
Tail cuticle	Smooth	9–11 spines	Smooth	4–10 spines
Tail appearance	Flexible, filiform	Stiff, spike-like	Flexible, filiform	Flexible, filiform
Eggs (μm)	100 × 41	143 × 35	130 × 40	140 × 48
Reference	Chabaud and Brygoo, 1962	Fitzsimmons, 1961	This paper	This paper

* Measurements are from anterior end and are in millimeters unless otherwise stated.

er posteriorly. The anterior-directed uterus reaches the level of the esophageal bulb then bends posteriorly. Gravid females with eggs reaching to level of esophageal–intestinal junction. Flexible, filiform tail 0.58 (0.54–0.64) with 7 (4–10) cuticular spines. Eggs fusiform 140 μm (137–148) × 48 μm (40–51), truncated ends, slightly flattened on 1 side, development to morula at deposition.

Taxonomic summary

TYPE HOST: *Pachydactylus bibronii* (A. Smith, 1845), Bibron's gecko (Sauria: Gekkonidae).

TYPE LOCALITY: Springbok, Cape Province, South Africa.

SITE OF INFECTION: Large intestine.

TYPE SPECIMENS: Holotype: male, U.S. National Parasite Collection, No. 86752; allotype, 86753; paratypes (9 males, 9 females), 86754.

ETYMOLOGY: The specific epithet is given in honor of Sir Andrew Smith (1797–1872), father of South African Zoology, who named *P. bibronii* in 1845.

Remarks

Species of *Spauligodon* are distinguished on the basis of the shape of the egg, the presence or absence of spines on the tail filament of adults, and geographical distribution (see Table 1 of Bursey and Goldberg [1995]). Both new nematodes should be added to that table. *Spauligodon petersi* sp. n., no spicule; male tail smooth; female tail smooth; egg ends pointed. *Spauligodon smithi* sp. n., spicule 80–97 μm; male tail smooth; female tail 4–10 spines; egg ends truncated. Chabaud and Brygoo (1962) have suggested that geographical distribution is the most important factor in the speciation of reptilian oxyurids. Comparisons of selected measurements of species from the Ethiopian Realm are presented in Table 1. *Spauligodon petersi* sp. n. and *S. smithi* sp. n. are easily separated from the 2 previously described Ethiopian species. Males and females of *S. morgani* have spines on short, nonflexible tail spikes; the eggs have pointed ends. Males and females of *S. dimorpha* have smooth, flexible, filiform tails; the eggs have truncated ends. Males and females of *S. petersi* sp. n. have smooth, filiform tails; the eggs have truncated ends. Females of *S. smithi* sp. n. have spines on a flexible, filiform tail; males have smooth tails; the eggs have pointed ends.

Acknowledgments

PSF thanks the Cape Province Department of Nature and Environmental Conservation of South Africa for issuance of collecting and ex-

port permits. Thanks also to D. Burdick, J. Furman, and K. Neitman for assistance in specimen collection and Susan Trammell for Figs. 1–12.

Literature Cited

Bursey, C. R., and S. R. Goldberg. 1995. *Spauligodon caymanensis* sp. n. (Nematoda: Pharyngodonidae) from *Anolis conspersus* (Sauria: Polychridae) from Grand Cayman Island, British West Indies. Journal of the Helminthological Society of Washington 62:183–187.

———, **and C. T. McAllister.** 1996. *Spauligodon goldbergi* sp. n. (Nematoda: Pharyngodonidae) and other parasites of *Sonora semiannulata* (Serpentes: Colubridae) from New Mexico and Texas. Journal of the Helminthological Society of Washington 63:62–65.

Chabaud, A. G., and E. R. Brygoo. 1962. Nématodes parasites de Caméleons malgaches. Deuxième note. Annales de Parasitologie Humaine et Comparée 37:569–602.

Fitzsimmons, W. M. 1961. A new nematode *Pharyngodon morgani* sp. nov., intestinal parasite of a lizard, *Mabuya striata*, in Nyasaland. Parasitology 51:395–399.

Skrjabin, K. I., Schikhobalova, N. P., and Lagodovskaja, E. A. 1960. Oxyurata of Animals and Man. Part One. Oxyuroidea. Israel Program for Scientific Translations, Jerusalem. 526 pp.

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Donations from members of the Helminthological Society of Washington for 1994 and 1995	$349.00	
In memory of A. O. Foster*	$1,150.00	
In memory of M. B. Chitwood*	$50.00	
Interest received in 1996	$945.37	
Disbursements		($380.00)
Support of author's page charges	($280.00)	
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*Contributions in memory of A. O. Foster were received from Judith H. Shaw, Frank W. Douvres and Trustees of the B. H. Ransom Memorial Trust Fund. A contribution in memory of M. B. Chitwood was received from Frank W. Douvres.

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